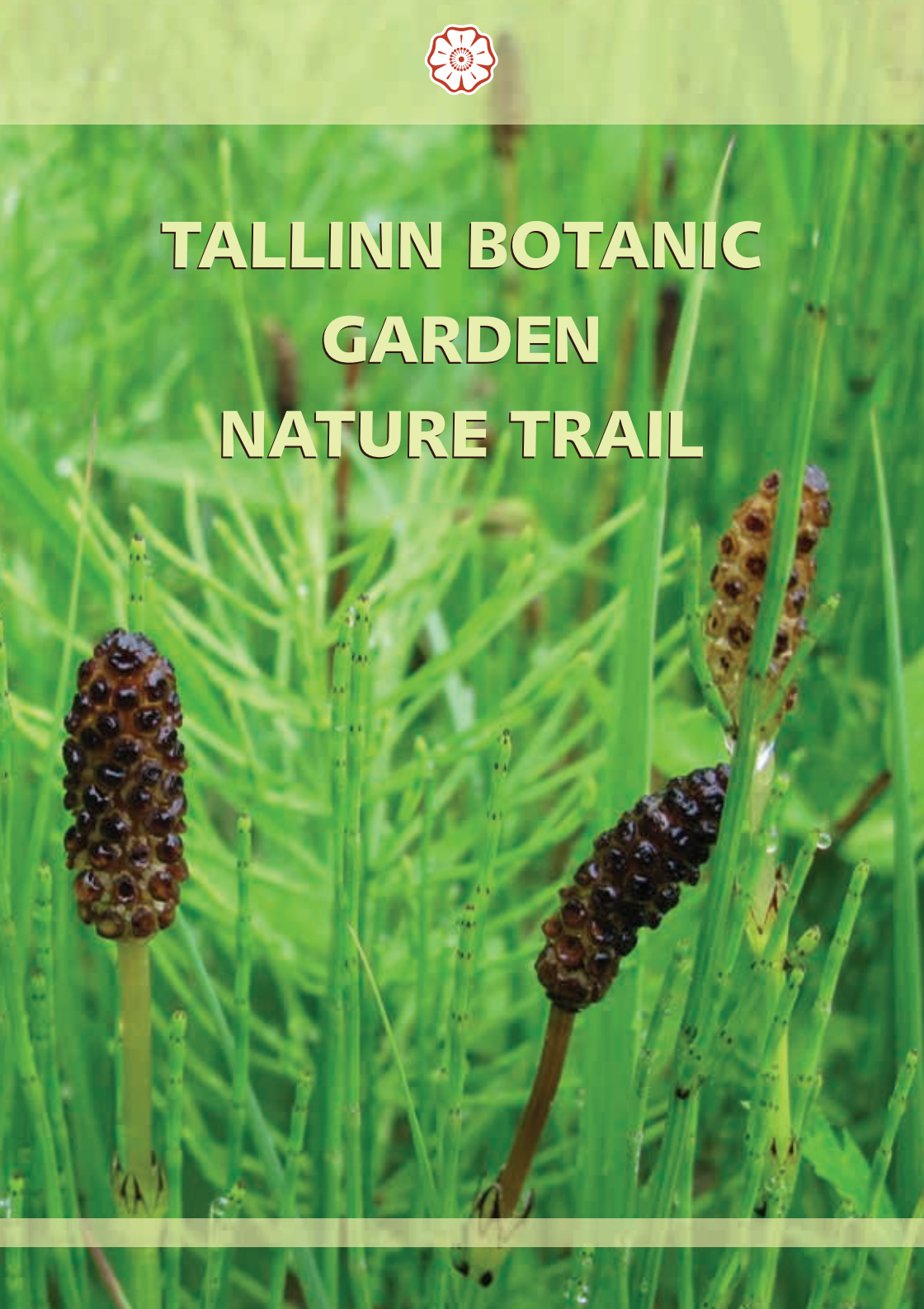




# TALLINN BOTANIC GARDEN NATURE TRAIL



## **Tallinn Botanic Garden Nature Trail**

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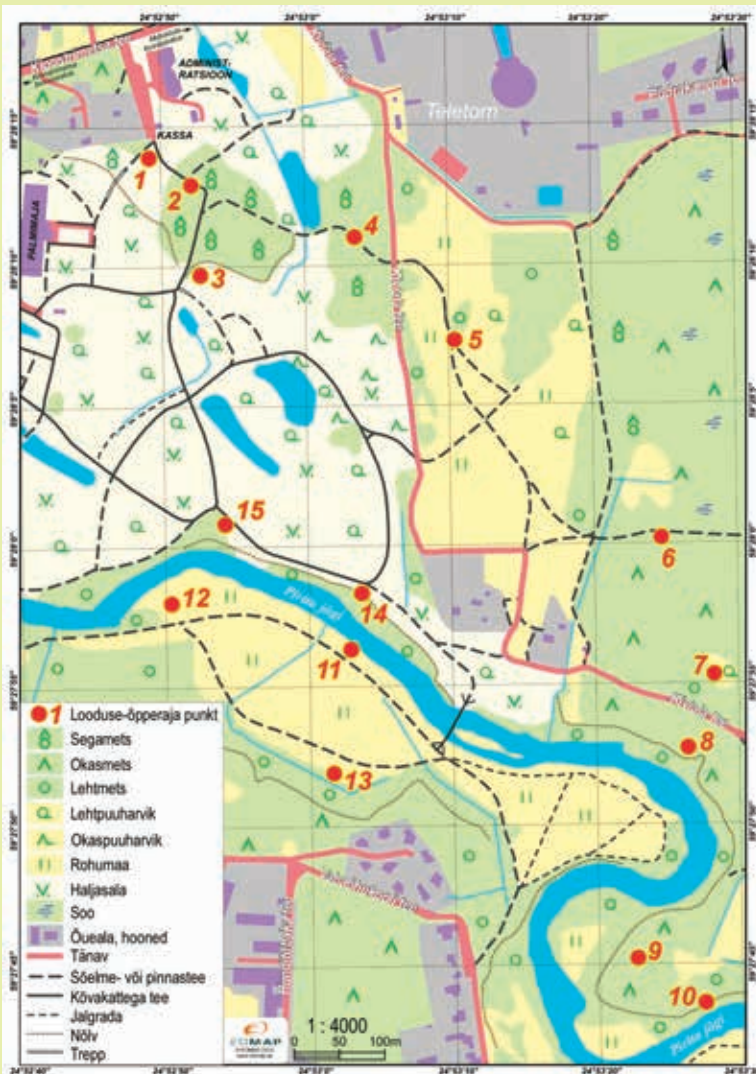
**Tallinn 2013**

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Construction of the 3.9 km long nature trail of Tallinn Botanic Garden (TBG) began in 1994. It was extended in 2002 and renovated in 2011 with the support of the Environmental Investment Centre. The nature trail leads us through 15 stops with information boards providing an overview of the landscapes and plants. Some of the stops are located within the TBG and some outside of it, but all of them can easily be found with the help of the map or GPS. The geographical coordinates are given in the table of contents.



# Dry boreo-nemoral grassland

**Boreo-nemoral grasslands are the most species-rich of all natural site types of Estonian flora.** Many former boreo-nemoral grasslands are today either cultivated or wooded.

**A few dry boreo-nemoral grasslands have been preserved on the shoals and islands of Western Estonia and on the plateau of Northern Estonia.**

Here **you can get an overview of the plants typical of dry boreo-nemoral grasslands**, for example sheep fescue (*Festuca ovina*), ribwort plantain (*Plantago lanceolata*), lady's mantle (*Alchemilla*), maiden pink (*Dianthus deltoides*), mountain sedge (*Carex montana*), silver cinquefoil (*Potentilla argentea*), red clover (*Trifolium pratense*), hare's-foot clover (*Trifolium arvense*) and colonial bentgrass (*Agrostis capillaris*).

**Ribwort plantain** (*Plantago lanceolata*) is related to the commonly known broadleaf plantain (*Plantago major*). It has not been commonly used in Estonian folk medicine, but in Western Europe it is the most popular of all plantains. In modern medicine it is used as one of the components in drugs used to cure colds and respiratory tract infections. In Estonia there are 24 species of **lady's mantle** (*Alchemilla*) – all of which are so similar that inexperienced eyes are unable to distinguish between them. Not that this is necessary: all of the species can be used as herbs to cure indigestion and women's illnesses.

The purple inflorescences of **red clover** (*Trifolium pratense*) catch your eye from afar. Unlike zigzag clover (*Trifolium medium*), it has a light triangle in the centre of the leaves. It has been used since the 11th century both externally (to cure dermatosis) and internally (to relieve coughs). **Here you can also find two Category III protected plants.**

**The small pasque-flower** (*Pulsatilla pratensis*) (photo 1) blooms from the end of April to the beginning of June. Its drooping florets are usually violet or yellowish white. It also has remarkable wind-spreading fruits – tiny nuts covered in thick hairs, which ripen in June.

The florets of **sea pink** (*Armeria maritima* ssp. *elongata*) are located at the top of leafless stalks and united in cluster-like compound inflorescences. They can be seen from June to August.



**Photo 1.** The small pasque-flower (*Pulsatilla pratensis*) can be found on dry sandy meadows and on the fringes of forests.



## Pine grove

The tree layer of nemoral forests usually consists of broad-leaved tree species: English oak (*Quercus robur*), Norway maple (*Acer platanoides*), European ash (*Fraxinus excelsior*), small-leaved lime (*Tilia cordata*), and wych elm (*Ulmus glabra*). **However, some conifers can also be found here**, such as Norway spruce (*Picea abies*) and Scot's pine (*Pinus sylvestris*), which **sometimes tend to dominate, with the original nemoral forest developing into a nemoral spruce forest or nemoral pine grove.**

**Here you can take a look at a pine grove.** The shrub layer is mainly dominated by hazel (*Corylus avellana*), fly-honeysuckle (*Lonicera xylosteum*), rowan (*Sorbus aucuparia*) and alpine currant (*Ribes alpinum*). In the grass layer you will find typical nemoral plants – the yellow corydalis (*Corydalis solida*) is the earliest to start blooming; it is immediately followed by wood anemone (*Anemone nemorosa*) and lily of the valley (*Convallaria majalis*). During the flowering period of anemones, wood millet (*Milium effusum*) enters the spearing phase.

During the bird cherry's flowering time, herb-paris (*Paris quadrifolia*) also starts blooming. One of the latest bloomers is **baneberry** (*Actaea spicata*) (photo 2), whose tiny white florets are united in short clusters located in the upper part of the plant or in the axils of the leaves. After blooming, its fleshy, multiple-seed berries start developing – these are green at first but become black as they ripen. The eye-catching fruit may seem tempting, but you should keep away from it, as well as from the baneberry generally – the plant is **poisonous!**

Likewise, do not touch the blackish-blue berries of the **herb-paris** (*Paris quadrifolia*), the orange-red berries of the **lily-of-the-valley** (*Convallaria majalis*) or the cherry red **berries** of the **May lily** (*Maianthemum bifolium*) – these **are poisonous** as well.



**Photo 2.** The baneberry (*Actaea spicata*) blooms in early June (above). Its berries ripen by the end of June (below).

## Valley of ferns

Here, in the **former side valley of the Pirita River**, is a **collection of local ferns** which was established in the 1970s.

On the northern side of the valley you can see a collection of a well-known fern species – the **ostrich fern** (*Matteuccia struthiopteris*) (photo 3). Its 150 cm long sterile feathery leaves form a symmetrical funnel. In the centre of the funnel there are significantly shorter leaves with sori. The leaves are olive green when young; they later turn a brownish colour. Apart from spore reproduction, the ostrich fern can also be reproduced vegetatively – it has a strong rhizome, which has been used as animal feed. Jam made from this rhizome has been used in folk medicine to ward off helminth and bed bugs.

The 140 cm long feathery leaves of the **male-fern** (*Dryopteris filix-mas*) are also located in a symmetrical funnel, but it does not have separate leaves for the sori. Its circle-shaped sori are located on the undersides of the leaves forming the funnel. In folk medicine its rhizome was used to expel tapeworms.

The double-feathery leaves of the **lady-fern** (*Athyrium filix-femina*) also grow in the shape of a funnel. The leaves are usually up to 1 metre long, sometimes even up to 1.5 metres. The sori are located on the undersides of the leaves and vary in shape. The lower ones are horseshoe-shaped, while the upper ones are oval. Jam made from its rhizome was also used to expel tapeworms.

From all three of the above-mentioned fern species, different ornamental plants have been bred. Side by side with the broad-leaved ferns you can find their leafless kin the **wood horsetail** (*Equisetum sylvaticum*) and **shady horsetail** (*Equisetum pratense*). The horse-tails have segmentary stalks to whose nodes whorl branches are fastened. But the leaves have involuted; what remains is visible as teeth in the nodes of the whorl branches. In order to make a



**Photo 3.** Similar to other ferns, the ostrich fern (*Matteuccia struthiopteris*) is also a cryptogam and never blooms.

distinction between a wood horsetail and a shady horsetail you have to take a closer look at the whorl branches – the wood horsetail has multiple-boughed branches, while the shady horsetail's whorl branches are non-furcating.

**Apart from ferns**, you will also find the eye-catching **perennial honesty** (*Lunaria rediviva*) which is a **Category III protected plant**. In the middle of the northern slope of the valley you should be careful – here grows the **giant hogweed** (*Heracleum mantegazzianum*), which **can cause skin burns**.

## Mixed oak forest

The heyday of the oak forests in Estonia was likely during the Atlantic climatic period (6000-3000 BC). **Nowadays there are very few natural oak forests left and they are mostly located in the western and northern parts of the country.** There are also a few cultivated oak forests.

The maximum possible age of the **pedunculate oak** (*Quercus robur*) is considered to be 1500-2000 years, but usually they are not older than 400-500 years. Oaks are fast-growing until they are approximately 60 years old; their growth then slows down. At the age of around 150 growth stops altogether, but thickening continues. The oak can be up to 50 metres tall and the trunk's diameter can be up to 4 metres. As Estonia is located quite close to the northern boundary of the oak's population area, those growing here are relatively small in terms of height.

The pedunculate oak blooms and buds simultaneously – in Estonia usually at the end of May or the beginning of June. Its acorns are ripe at the end of September or the beginning of October. The time its leaves start to fall varies – the leaves of some trees have already fallen by the end of October, while some retain their dried leaves throughout winter. The fallen leaves decompose very slowly due to their high level of tannin.

**In our oak forest** you can also see Scots pines (*Pinus sylvestris*). The shrub layer contains rowan (*Sorbus aucuparia*), bird cherry (*Prunus padus*) and common juniper (*Juniperus communis*), and there are several herbs, like wild angelica (*Angelica sylvestris*), cow-wheat (*Melampyrum nemorosum*) and lily-of-the-valley (*Convallaria majalis*).

**The trunks of old oaks often provide a proper living** for mosses, lichens and tree fungi. Although lichens may remind you of plants, they belong to the group of fungi. Here you can see three very common and easily distinguishable lichen species.

**Shield lichen** (*Parmelia sulcata*) has a grey leafy thallus, and the flaps are square at the end. The thallus of **oakmoss** (*Evernia prunastri*) is bushy, pendant or well-furnished. Its branches are flattened and it has a characteristic colour – greenish-yellow on top and whitish on the underside.

**Farinose cartilage lichen** (*Ramalina farinacea*) has a bushy, well-furnished or pendant thallus and both of its sides are yellowish or greyish-green.

The ends of the branches are evenly tapering and often have small hooks at the end.



**Photo 4.** On the trunk and branches of this pedunculate oak (*Quercus robur*) live mosses, lichen and tree fungus.



## Sites of bog iron ore

**Iron ore** is very common in nature. Its mass in the lithosphere is 6% – making it the second most common metal in the world after aluminium. In Estonia **it is the only metal that could historically be produced from local raw material, and therefore bog iron ore** (bog iron, brown iron ore or limonite  $\text{Fe}_2\text{O}_3 \times n\text{H}_2\text{O}$ ) (Photo 5) was **one of the most important mineral resources during the Iron Age**.

The Iron Age began in the Middle East, India and Greece at the end of the second millennium BC; in most of modern-day Europe it began in the first millennium BC. In Estonia it lasted from approximately 500 BC to the beginning of the 13th century. During this period people settled and began to cultivate land and raise livestock, and this brought about a need for tools. The oldest iron objects found in the country – unearthed in Jäbara near Kohtla-Järve – were probably imported, but production of iron from local bog iron soon commenced.

To get iron from bog iron, furnaces were used, traces of which have been found all over Estonia. But producing iron was more extensive in North-Eastern Estonia and on Saaremaa. **The bog iron deposit in Kloostri-metsa was discovered in 1977** during construction of Tallinn's TV tower.

Among the plants growing here are several meadow and ruderal plants: examples are the common yarrow (*Achillea millefolium*), imperforate St John's-wort (*Hypericum maculatum*) and reed canary-grass (*Phalaris arundinacea*).

**Common yarrow** (*Achillea millefolium*) is one the best known herbs promoting digestion. Tea made from its inflorescences or herb improves bile secretion and decreases gas complaints, but it also has an anti-inflammatory and anti-bleeding effect. Inflorescences and herbs are picked during the flowering period – usually May and June, when the amount of active ingredients in the plant is highest. Fresh yarrow is also a natural mosquito repellent – smearing it onto your skin will keep the tedious insects away for a couple of hours.

The healing properties of tea made from **imperforate St John's-wort** (*Hypericum maculatum*) are not as effective as those of perforate St John's-wort (*Hypericum perforatum*), but the tea has a soothing and regulating impact on the digestive system and helps relieve menstrual complaints in women. The herb can be picked during the flowering period before its fruits appear in July and August. Please note, however, that when sunbathing or using a sun-bed you should avoid drinking St John's-wort tea: it increases the skin's sensitivity to light and may lead to hypericism, the symptoms of which are swelling and itching. If you scratch yourself you could cause serious wounds.



**Photo 5.** Bog iron ore can be found here in pieces as big as a fist.

## Boggy pine grove

The soil in boggy forests is water-saturated – it is permanently of high humidity, acidic and nutrient-deficient. Such soil is not suitable for most trees, and as such the main species in boggy forests are either the forbearing Scots pines (*Pinus sylvestris*) or downy birches (*Betula pubescens*), both of which prefer humid, wet soils. Sometimes Norway spruce (*Picea abies*) can also prevail in this type of forest. Here the tree layer contains not only Scots pine (*Pinus sylvestris*) but also some Norway spruces (*Picea abies*), birches (*Betula*), aspens (*Populus tremula*) and grey alders (*Alnus incana*).

In the shrub layer you can see rowan (*Sorbus aucuparia*), willow (*Salix*), raspberry (*Rubus idaeus*) and alder buckthorn (*Frangula alnus*). While practically everybody knows the first three species, alder buckthorn (*Frangula alnus*) is unfamiliar to most. Its stone fruits – at first greenish-red, and black when ripe – are eye-catching, but must not be eaten since they are poisonous. But the bark of the buckthorn can be used, for example, to dye wool or as a medicine. Jam made from buckthorn bark has been used to relieve constipation and liver pain. The bark is collected in spring during the sapping period when it comes loose.

Among the ground vegetation you can see marsh tea (*Ledum palustre*), bog bilberry (*Vaccinium uliginosum*), bilberry (*Vaccinium myrtillus*), cowberry (*Vaccinium vitis-idaea*), heather (*Calluna vulgaris*), barrow buckler-fern (*Dryopteris carthusiana*), hare's-tail cottongrass (*Eriophorum vaginatum*), interrupted clubmoss (*Lycopodium annotinum*), cloudberry (*Rubus chamaemorus*) and serrated wintergreen (*Orthilia secunda*).

Serrated wintergreen (*Orthilia secunda*) (photo 6) is common in several types of forest – in the knolls of boggy forests as well as in mesotrophic boreal forests, oligo-mesotrophic boreal forests, swamp forests and floodplain forests. It is rather inconspicuous due to its low growth and rare blooming (it does not bloom before the third or fourth year of growth), but it is a fascinating plant that is well-adjusted to life in the forest: it has developed a good partnership with fungi (fungal roots or mycorrhiza). You will also find mosses here, for example red-stemmed feather-moss (*Pleurozium schreberi*), mountain fern moss (*Hylocomium splendens*) and common haircap moss or great goldilocks (*Polytrichum commune*).

The presence of common haircap moss (*Polytrichum commune*) in a forest is a definite sign that it is becoming a bog – it is capable of growing in very humid soil. It may seem small at first glance, but if you study it further you will find that it can grow as tall as 50 cm. Indeed, it is the tallest moss found in our forests.



**Photo 6.** The racemes of the greenish-white florets of serrated wintergreen (*Orthilia secunda*) are one-sided and often inclined.

## Birch grove

**Around 30% of all Estonian forests are birch groves.** Depending on the soil fertility and water regime, they can consist of either **silver birch** (*Betula pendula*) or **downy birch** (*Betula pubescens*), or both.

**This birch grove is dominated by downy birch** (*Betula pubescens*), but some silver birches (*Betula pendula*) and Scots pines (*Pinus sylvestris*) can be found here as well.

Both species have seen use in folk medicine: tea made from birch buds is used to improve bile, urine and sweat secretion; tea made from their leaves is used in the case of bladder and kidney infections; and tar made from birch bark and wood is used to cure skin infections. Birch buds are collected before the blooming period and their leaves in early summer in May and June, when they have the best aroma and contain the maximum amount of active ingredients. In spring it is worth taking the opportunity to drink birch sap instead of lemonade – it will quench your thirst and improve your digestion.

**In the shrub layer** you can see fly honeysuckle (*Lonicera xylosteum*), alder buckthorn (*Frangula alnus*) and common hazel (*Corylus avellana*).

**The grass layer** contains, for example, chickweed-wintergreen (*Trientalis europaea*), may lily (*Maianthemum bifolium*), narrow buckler-fern (*Dryopteris carthusiana*), oak fern (*Gymnocarpium dryopteris*), greater celandine (*Chelidonium majus*) and wood-sorrel (*Oxalis acetosella*).

Almost everyone will know the **wood-sorrel** (*Oxalis acetosella*) (photo 7): it has a pleasant sourish flavour, and as an extra bonus is also very healthy. Its herb – the above-ground part of the plant – contains a lot of vitamin C, so it has been used in the past to ward off scurvy. In folk medicine the liquid extract of wood-sorrel has been used in cases of stomach hypoacidity and low appetite; externally it has been used to cure wounds and skin infections. But as is the case with all herbs, you should not overindulge – excess use may damage your kidneys.



**Photo 7.** The wood-sorrel (*Oxalis acetosella*) blooms in May and June.

## Pine grove

**Pine groves** make up approximately 35% of all forests in **Estonia**, being **the largest** of all forest types.



**Photo 8.** The Scots pine (*Pinus sylvestris*) exhibits both old and young cones in early June.

in Estonia you will see here, for example, field wormwood (*Artemisia campestris*), great willowherb (*Epilobium angustifolium*), sticky catchfly (*Lychnis viscaria*), wild strawberry (*Fragaria vesca*), common valerian (*Valeriana officinalis*) and greater celandine (*Chelidonium majus*).

**Common valerian** (*Valeriana officinalis*) is a well-known herb. Thanks to the cumulative effect of the agents it contains, it has a calming and stress-relieving effect and also helps in the case of sleeping problems. Industrially produced herbal preparations are usually more effective than home-made herbal teas, due to the more precise concentration of active ingredients and the use of other herbs with a similar effect.

**Greater celandine** (*Chelidonium majus*) is also a herb. When applied topically, it helps against bruises, sprains, joint pain and warts.

Internally it has an antimicrobial and anti-inflammatory effect; it can also reduce muscle spasms and pain. As it is a very efficient herb, it is not recommended to be used internally without your doctor's instructions.

**Scots pine** (*Pinus sylvestris*) (photo 8) is a tenacious and fast-growing tree, often being the absolute ruler in the tree layer, as is the case in this forest. As its needles and shoots contain a lot of ethereal oils, they are often used in naturopathy – mainly for inhalation in the case of infections and internally in the form of a liquid extract. Externally they can be effectively used in the case of muscle, joint and nerve pain. As they contain a lot of vitamin C, they can also be used to ward off scurvy. Pine resin and pine tar help heal wounds and treat skin diseases. Pine shoots are collected in spring, from May to June.

The shrub layer of this pine grove contains rowan (*Sorbus aucuparia*), raspberry (*Rubus idaeus*) and mountain currant (*Ribes alpinum*).

Among the **herbs**, the Category II protected **rare mountain alison** (*Alyssum montanum* ssp. *gmelinii*) deserves special attention. Among the more common herbs

## Hazel wood. Hop-plant

**Hazel woods** are groves and shrubs or forests with a sparse tree layer where **common hazel** (*Corylus avellana*) **dominates** the shrub layer.

The **tree layer** of this hazel wood consists of a few Scots pines (*Pinus sylvestris*), birches (*Betula*) and Norway maples (*Acer platanoides*).

In the **shrub layer**, side by side with the hazels, are bird cherry (*Prunus padus*) and rowan (*Sorbus aucuparia*).

The **common hazel** (*Corylus avellana*) is mainly known for its hazelnuts, which can be eaten fresh or roasted. But its bark and leaves can also be used medically – the bark is used to treat diarrhoea and temperatures, while the leaves can be used in the case of diarrhoea and also as an antibacterial agent. The bark is collected in spring; the leaves mainly in the first half of summer.

The **grass layer** contains, for example, spring fumewort (*Corydalis solida*), ground elder (*Aegopodium podagraria*), yellow archangel (*Galeobdolon luteum*), wood crane's-bill (*Geranium sylvaticum*) and wood avens (*Geum urbanum*).

On the riverside you can see common **hop-plants** (*Humulus lupulus*) (photo 9) twining around the trees. People have learned to use its cone-like female inflorescences for several purposes. They are common ingredients in beer, as the bitter substance of the hop-plant prolongs the storage period of beer and gives it its special taste and aroma. The inflorescences of hop-plants are used in herbal teas to relieve anxiety, sleeping problems, fatigue and loss of appetite. Hop-plant jam can be used to wash your hair if you suffer from hair loss and it is an effective anti-rheumatic cream. Inflorescences are collected in the middle or at the end of August.



**Photo 9.**

The so-called hop-plant cones are only to be found on female plants (*Humulus lupulus*).



## Aspen grove



**Photo 10.** The goldenrod (*Solidago virgaurea*) grows naturally in meadows and forest plains and on roadsides.

Buds are collected early in the spring when they are about to burst, while the bark is collected a little later in the spring and the leaves in early spring.

In addition to aspen (*Populus tremula*), **also** the pedunculate oak tree (*Quercus robur*) and European barberry (*Berberis vulgaris*) and guelder-rose (*Viburnum opulus*) **bushes** grow in this grove.

You can also see the following **herbaceous plants** here: wood small-reed (*Calamagrostis epigeios*), lily-of-the-valley (*Convallaria majalis*), angular solomon's-seal (*Polygonatum odoratum*), hedge bedstraw (*Galium mollugo*) and goldenrod (*Solidago virgaurea*).

**European goldenrod** (*Solidago virgaurea*) (photo 10) is the only naturally growing goldenrod in Estonia, but in these gardens you will find two other species – Canada goldenrod (*Solidago canadensis*) and autumn goldenrod (*Solidago gigantea*), which start growing in the wild very quickly. The first is registered in the Estonian Black Book of Invasive Species.

The **aspen** (*Populus tremula*) is common in Estonia. During the last decade, the area of aspen groves has grown here mainly because it is one of the species that start growing on grasslands that are no longer in use.

The fact that aspen is highly susceptible to wood-damaging fungi, especially aspen bracket (*Phellinus tremulae*), makes it unsuitable for construction – but this does not mean that it cannot be used at all. As aspen wood is easily cleavable, strong and durable when dry, it is used to make roof chips, planks, veneer and matches. Aspen is also used to make wooden dishes because it has no flavour. Aspen enjoys a worthy position in naturopathy – its bud is used to make an anti-rheumatic and anti-inflammatory salve; and drugs made from its leaves and bark are used externally to relieve infections and kill bacteria, but also as an efficient pain killer. Its leaves can be used to make

## Water plants in Pirita River

**Pirita River is one of the biggest in the river basin of Harju County and the Gulf of Finland** – it is the second longest (105 km) and also has the second biggest catchment area (799 km<sup>2</sup>).

**There are 38 different species of vascular plants in the river.**

The most common and indeed the most eye-catching of all the species is the yellow water lily (*Nuphar lutea*); the upper course is dominated by common brookline (*Veronica beccabunga*) and tufted loosestrife (*Lysimachia thysiflora*); the middle course is home to communities of broad-leaved pondweed (*Potamogeton natans*), red pondweed (*Potamogeton alpinus*) and flowering rush (*Butomus umbellatus*); the lower course is mostly dominated by common club-rush (*Schoenoplectus lacustris*) but also branched bur-reed (*Sparganium erectum*); and in some places huge communities of water horsetail (*Equisetum fluviatile*), mare's-tail (*Hippuris vulgaris*) and Canadian waterweed (*Elodea canadensis*) can be seen.

The **yellow water lily** (*Nuphar lutea*) is poisonous to people when eaten fresh, but its rhizome is a common food for voles (*Arvicola amphibius*) and beavers (*Castor fiber*). But when dried the rhizome loses its toxicity, and as the plant is high in starch it has also been used as food for people – as a vegetable, or it can be added to cakes and porridges in ground form.

The rhizomes of the **flowering rush** (*Butomus umbellatus*) (photo 11) are also high in starch and can be eaten. It is best known in Siberia where making bread with flour made from its rhizome is so common that it even has its own name – Yakut bread. Its long, strong leaves have been used to weave mats and baskets.

**Canadian waterweed** (*Elodea canadensis*) is an alien species that derived its name from its fast vegetative spreading – it is of American origin, but during the 20th century it spread all over Europe. It can be found almost everywhere on the Estonian mainland, but is especially abundant in parts of South-Eastern Estonia. As an invasive alien species it is registered in the Estonian Black Book of Invasive Species. It can be used as animal feed and to make silo or as green manure in fields. In water it provides shelter and food for many fish and aquatic invertebrates.



**Photo 11.** The umbel-type inflorescences of the pink florets of the flowering rush (*Butomus umbellatus*) will catch your eye from afar.

## Flooded meadow

**Flooded meadows are located in river valleys and sometimes also in lake valleys that are regularly flushed by flood water.**

**In Estonia there are not many of these – in the Northern Estonian limestone areas there are practically none.** However, there are a few in Southern and Central Estonia and by the larger rivers in Western Estonia.

The biggest and best-known flooded meadow on the Pirita River is Tuhala, which is located within the borders of Rae, Kiili, and Kose parishes. The only flooded meadow of conservation value in Harju County is Tuhala-Kata, located by the Tuhala River in Kose Parish.

**Flooded meadows are mainly of secondary origin – they have developed as a result of human activity** to replace oak, elm and European white elm flooded forests, alder marshes, grey alder groves and floodplain willow shrublands. Initially they **were used as pastures** or later as **hay fields, but today** most have fallen out of use and are tending to **grow over** – without human assistance only low meadows and the northern slopes of rivers remain forestless.

A peculiarity of meadow flora is that the species of soggy habitats occur in the community of xerophilous species, while the species of drier habitats occur among the hygrophytic community. In this flooded meadow you can see water chickweed (*Myosoton aquaticum*), hedge bindweed (*Calystegia sepium*), water avens (*Geum rivale*), common nettle (*Urtica dioica*) and meadowsweet (*Filipendula ulmaria*).

Rhizomes of **water avens** (*Geum rivale*) (photo 12), as well as those of wood avens (*Geum urbanum*), contain a tannin that has a healing effect in the case of diarrhoea, loss of appetite and indigestion. Avens are also used to flavour liquors and brandies. The rhizomes are collected in spring until May.

The **common nettle** (*Urtica dioica*) is considered one of the most disagreeable and



tedious weeds, but it is actually a very useful plant. You can make soups and salads using the spring offshoots, which are rich in vitamins, and tea made from its leaves and herbs has an anti-inflammatory effect and improves urine secretion and coagulation. Nettles can be collected throughout the vegetation period to add to water with which to wash your hair – this improves growth and reduces dandruff. They can also be used to dye wool, and the fibre made from its stalk is used to make cloth, cord and net.

**Photo 12.** The blossoms of water avens (*Geum rivale*) are drooping, with pale red sepals and cream-coloured petals.

## Floodplain willow shrubland

**Floodplain willow shrublands mainly consist of willows (*Salix*).** They either lack a tree layer completely or it is sparse; the shrub layer is of average or greater thickness. There are about 450 species of willows in the world, and they can be found on all continents bar Australia. They endure cold winters, which is why most species grow in the moist habitats of the temperate zone of the Northern Hemisphere. However, the population area of some species extends further to the south.

The benefits of willows have been known for a long time. One of the seven hills of ancient Rome was named *Collis viminalis* after the food baskets and shields made from basket willow (*Salix viminalis*). Baskets, lamps and even tables and chairs made of osier are popular even today. Since ancient times, willow has been used to tan leather and dye cloth. It has also been known as a medicinal herb – back then it was believed to



**Photo 13.** The sprouts of the tea-leaved willow (*Salix phylicifolia*) are hairless, the undersides of leaves are light and the upper sides are dark green and glossy.

cure many diseases, but we now know that the bark of young sprouts and branches contains salicin, which can be used to reduce temperatures and relieve pain, including rheumatic pain. As willows grow fast, they are often grown in plantations to purify the environment.

But humans are not the only species to benefit from willows – waterside willow shrublands are ideal habitats for the European mink (*Mustela lutreola*). White willow (*Salix alba*) and crack willow (*Salix fragilis*) also provide the beaver (*Castor fiber*) with food and dam-building material.

There are 20 different species of willows in Estonia. In this shrub you can see four of them: dark-leaved willow (*Salix myrsinifolia*), grey willow (*Salix cinerea*), tea-leaved willow (*Salix phylicifolia*) (photo 13) and some goat willow (*Salix caprea*).



## Alder grove

**Alder groves are ranked fourth** among Estonian forests (11%). On wet soils their stands are formed of grey or white alder (*Alnus incana*); on soil with moving ground water, by common or black alder (*Alnus glutinosa*).

The **common alder** (*Alnus glutinosa*) is a highly valuable tree. Its wood is light, well-workable and durable in water. It can be used to produce musical instruments, furniture and veneer and it is easy to carve. But it also makes good firewood. The bark is used to tan leather and is a highly valued wood for smoking meat, as it gives it an excellent flavour and appetizing appearance.



**Photo 14.** A blooming bird cherry (*Prunus padus*) can be smelled from afar and even in the dark – its white flowers have a strong characteristic scent.

herbal teas used to alleviate gastritis, diarrhoea and infections of the small and large intestines. It is also used for gargling in the case of infections.

**The alder grove here is that of the grey alder.** Side by side with the main species are bird cherries (*Prunus padus*), in the form of both trees and bushes.

The black drupes of the **bird cherry** (*Prunus padus*) (photo 14) are often thought to be poisonous, but this is not true – only the seeds are poisonous. After removing the seeds, the fruits can be eaten. They are especially effective in cases of diarrhoea and inflammatory bowel diseases.

The **grass layer** contains lesser celandine (*Ranunculus ficaria*), ground-ivy (*Glechoma hederacea*), ground elder (*Aegopodium podagraria*) and meadowsweet (*Filipendula ulmaria*). On the coast you can also see wood club-rush (*Scirpus sylvaticus*) and common club-rush (*Schoenoplectus lacustris*).

The wood of the **grey alder** (*Alnus incana*) is not as durable, but it is nevertheless used to make boxes and cases. It is used as firewood and for smoking meat and fish. As its bark is high in tannins and colorants, it has been used to tan and dye leather.

Both alders are also used as medicinal herbs – its bark and conical collective fruits have an astringent effect, which is why they are added to



## Chapel Hill

**There is no chapel or ruins to admire here** – it is not even known if there was ever a chapel at all. It is not entirely impossible though, as the land once belonged to Pirita Convent, but there is no proof.

**At the foot of the hill is a collection of elders** (*Sambucus*) that contains species found in Estonian forests as well as those growing in other countries. In Estonia we have two different species: the red-berried elder (*Sambucus racemosa*) and the common elder (*Sambucus nigra*).

The red-berried elder (*Sambucus racemosa*) (photo 15) grows naturally in Central Europe, in the northern part of Southern Europe and in Western Asia. In Estonia we can see it wherever birds have spread its seeds. The blossoms of the red-berried elder are greenish-yellow and have no scent; the fruits are red drupes. Jams, juices and marmalades can be made from its fruits, but the seeds cannot be used – they are poisonous. The red-berried elder is not used as a medicinal herb.

The **common elder** (*Sambucus nigra*) is found from Europe to Western Siberia. It is not an indigenous species, but has spread everywhere as a domesticated one. The conditions in the western part of the mainland and on the islands are more favourable for the common elder; the severe winters in Eastern and Southern Estonia can damage the sprouts. The florets of the common elder are white and scented; the fruits are black drupes. The fruits are edible when ripe, but contain poisonous prussic acid when raw. Juices and compotes are made from the ripe fruits. Its fruits, blossoms, leaves, roots and bark have been used in folk medicine. Scientific medicine makes use primarily of its blossoms, and sometimes also its leaves, but the other parts are not commonly used. The blossoms can improve sweat and urine secretion and also have an anti-inflammatory effect – which is why they are used in the case of colds to make patients sweat.



**Photo 15.** The blossoms of the red-berried elder (*Sambucus racemosa*) are greenish-yellow, not white like those of the common elder (*Sambucus nigra*).

## Materials used:

- Järvekülg, A. 2001. Eesti jõed. Tartu, 750 lk.
- Jürgens, K., Heinsoo, K., Koppel, A. 2006. Paju, mitmekülgne ja kasulik puu. Eesti Loodus, 12, lk 6–10.
- Laas, E. 1987. Dendroloogia. Tallinn, 824 lk.
- Laasimer, L. 1965. Eesti taimkate. Tallinn, 397 lk.
- Lavi, A. 1999. Põhja-Tartumaa rauatööst muinas- ja vara-keskajal. Eesti Arheoloogia Ajakiri, 3,1, lk 35–62.
- Leibak, E., Lutsar, L. (toim.) 1996. Eesti ranna- ja luhaniidud. Tallinn, 263 lk.
- Paal, J. 1997. Eesti taimkatte kasvukohatüüpide klassifikatsioon. Tallinn, 297 lk.
- Raal, A. 2010. Maailma ravimtaimede entsüklopeedia. Tallinn, 1007 lk.
- Reier, Ü. 2006. Palju pajusid ja mõned remmelgad. Eesti Loodus, 1, lk 6–13.
- Roht, U. 2007. Lehtpuud I. Tartu, 380 lk.
- Sander, E. & Kasemets, M. (koost.) 2006. Tallinna Botaanikaiaia looduse-õpperada. Tallinn, 17 lk.
- Tammeorg, J., Kook, O., Vilbaste, G. 1972. Eesti NSV ravimtaimed. Tallinn, 287 lk.
- Valk, U., Eilart, J. 1974. Eesti metsad. Tallinn, 308 lk.
- Valsiner, A. 1977. Õppekäigud salumetsa. Tallinn, 128 lk.
- Eestikeelsete imetajanimetuste andmebaas. [<http://www.elus.ee/imetajad/>] 8.05.2012
- Eestikeelsete taimenimede andmebaas. [<http://www.ut.ee/taimenimed/>] 09.05.2012
- Lang, V. 2007. Pronksiaeg ja vanem rauaaeg Eestis. Eesti Arheoloogia Ajakiri, 3, lk 71–110. [[http://www.arheo.ut.ee/EA3\\_03.pdf](http://www.arheo.ut.ee/EA3_03.pdf)] 18.03.2010
- Ojaveer, H., Eek, L., Kotta, J. 2011. Vee võõrliikide käsiraamat. Tallinn, 67 lk. [<http://www.envir.ee/orb.aw/class=file/action=preview/id=1169271/voorliigid+vees+veeb.pdf>] 07.05.2012









